

SWBAT understand the meaning of standard position, coterminal, and periodicity.

Agenda:

Warm-Up

HW Q's

Defining 3 key terms

Practice

Exit Card

### Warm - Up

Using the unit circle, find the following:

$$\cos 30 = \frac{\sqrt{3}}{2}$$

$$-\tan 90 = \frac{1}{0} = \text{undefined}$$

$$\sin \frac{11\pi}{6} = -\frac{1}{2}$$

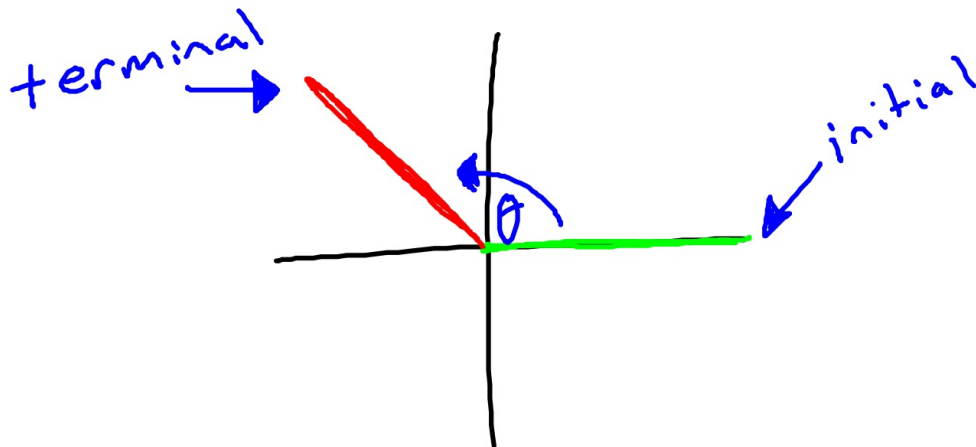
## Defining Tangent!

$$\tan \theta = \frac{O}{A} \quad \cos \theta = \frac{A}{H} \quad \sin \theta = \frac{O}{H}$$
$$\underline{H \cos \theta = A} \quad \underline{H \sin \theta = O}$$

$$\tan \theta = \frac{H \sin \theta}{H \cos \theta}$$

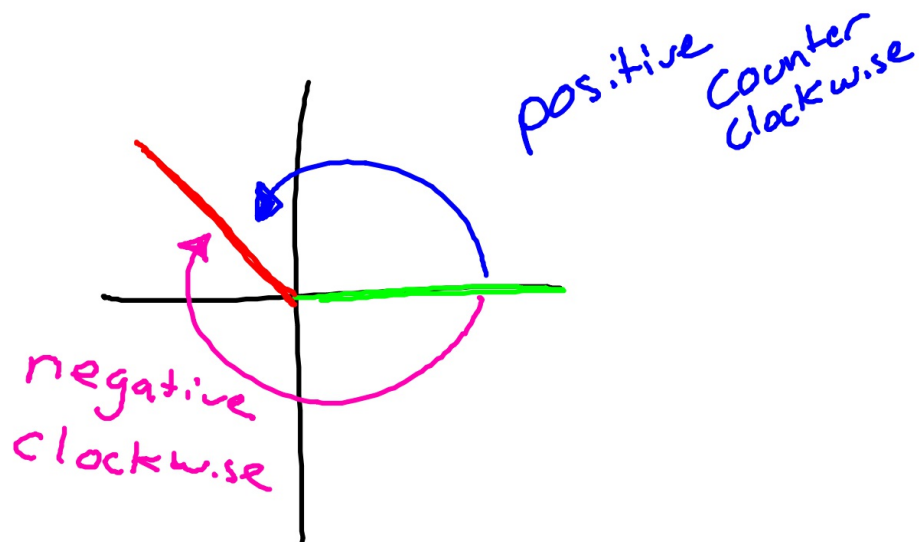
$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

## Initial Side and Terminal Side



Standard Position is an angle with the vertex at the origin and its initial side lying along the positive x axis.

### Positive and Negative Angles

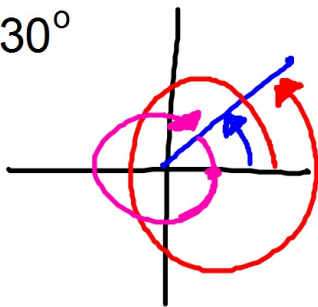


## Coterminal Angles

Two angles are coterminal if they are drawn in the standard position and both have their terminal sides in the same location.

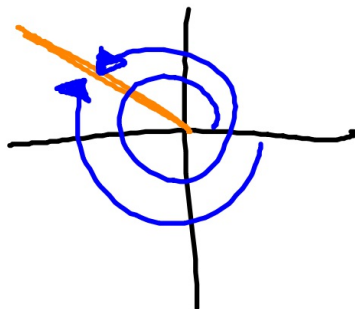
Examples: Find and draw a positive angle and a negative angle that are coterminal with the given angle.

a)  $30^\circ$



$$30^\circ + 360^\circ = 390^\circ$$
$$30^\circ - 360^\circ = -330^\circ$$

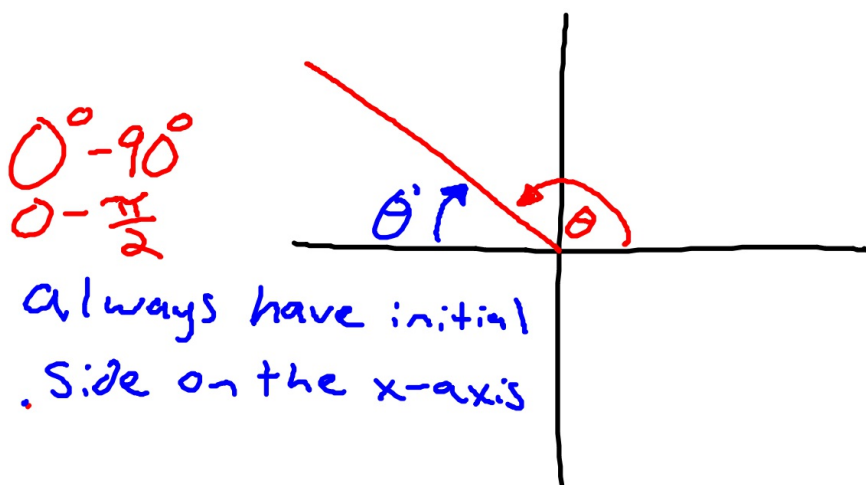
b)  $\frac{2\pi}{3}$



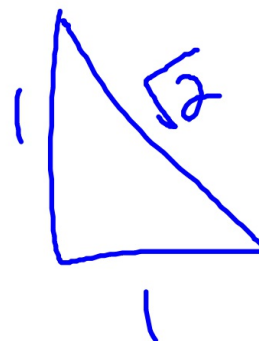
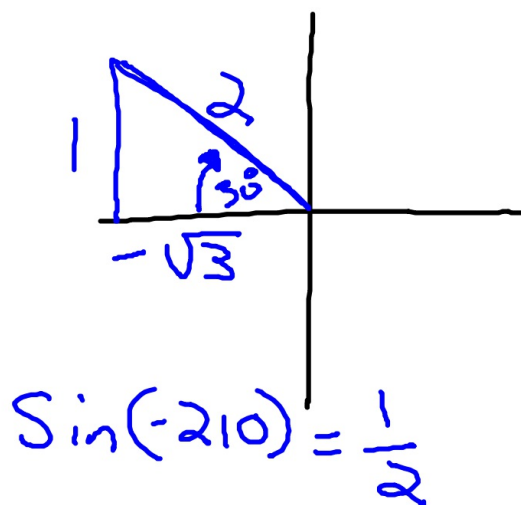
$$\frac{2\pi}{3} + \frac{6\pi}{3} = \frac{8\pi}{3}$$

$$\frac{2\pi}{3} - \frac{6\pi}{3} = -\frac{4\pi}{3}$$

## Reference Angles



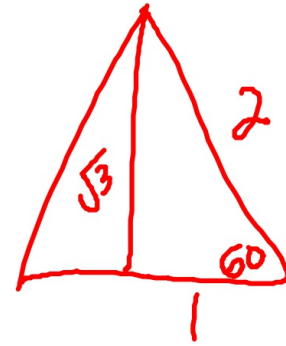
Example: Find  $\sin(-210)$



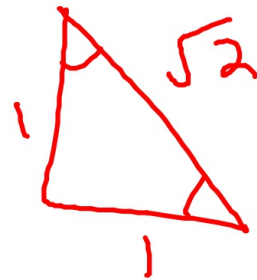
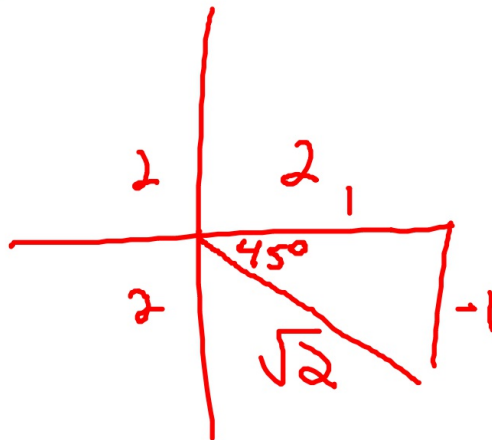
Example: Find  $\tan\left(\frac{5\pi}{3}\right) \rightarrow \frac{10\pi}{6}$



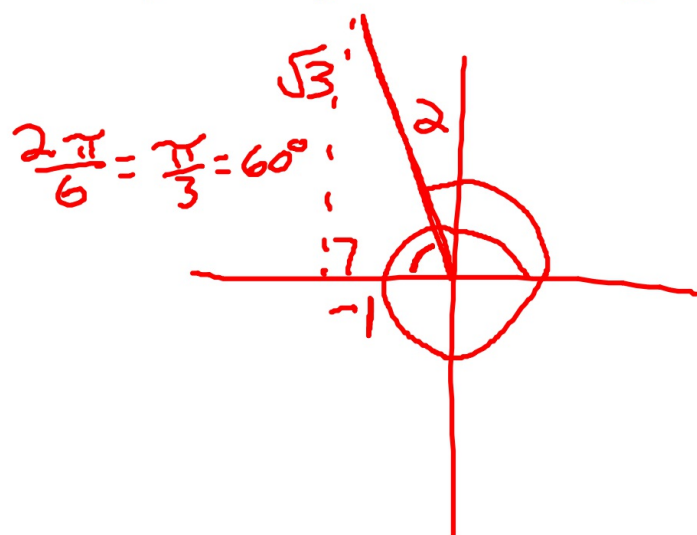
$$\tan\left(\frac{5\pi}{3}\right) = -\sqrt{3}$$



$$\cos\left(\frac{7\pi}{4}\right) = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$



$$\sin\left(\frac{8\pi}{3}\right) = \frac{\sqrt{3}}{2} \quad \frac{16\pi}{6}$$



## Periodic Functions

A function  $y = f(t)$  is periodic if there is a positive number  $c$  such that  $f(t + c)$  for all values of  $t$  in the domain of  $f$ . The smallest such number  $c$  is called the period of the function.

## Exit Card

Find  $\sin(-120)$